1.10.5. Select the correct answer 00 05

In a relational model, consider the following ER-to-Relational transformation rules:

- An entity with a primary key is converted to a relation.
- 1:N relationships are converted by adding a foreign key in the "many" side referencing the "one" side.
- M:N relationships are converted to a new relation.

For the following ER diagram:

- Entity: Department(DeptID)
- Entity: Employee(EmpID)
- Relationship: WorksFor (M:N between Employee and Department)

What would be the resulting relational schema for the "WorksFor" relationship?

- Employee(EmpID, DeptID)
- WorksFor(EmpID, DeptID)
- Department(DeptID), Employee(EmpID, DeptID)
- **Department(DeptID), Employee(EmpID), WorksFor(EmpID, DeptID)**
- WorksFor(EmpID, DeptID, JoinDate)

Section - 1 Marks per question : 2.0 **Marks Scored : 18.0**

Q No.	Q. Type	Status	Marks	
1	Multiple Choice - Single Answer	✔	2.0	Hide Answer

You are tasked with designing a database for a Navy fleet management system. The system needs to manage various aspects of the fleet, including ships, crew members, missions, and equipment. Each ship can have multiple crew members, and each crew member can participate in multiple missions. Additionally, each mission may involve multiple ships and have specific equipment assigned. Which of the following database models would be the most suitable for designing the database schema for this system?

- ○ Hierarchical Model
- ◉ Entity-Relationship Model (ER)
- ○ Relational Model
- ○ Graph Model

Q No.	Q. Type	Status	Marks	
2	Multiple Choice - Single Answer	✔	2.0	Hide Answer

In a flight booking system, the relational database schema defines the structure of the system's data, including tables like Flights, Passengers, and Bookings. Each table has attributes such as FlightID, PassengerName, and BookingDate. Meanwhile, the relational database instance represents the actual data at a given time, such as the current flights, booked passengers, and dates.

Which of the following statements best describes the relationship between the relational database schema and the relational database instance in this flight booking system?

- ○ The relational database schema is dynamic and changes frequently, reflecting real-time flight data, while the relational database instance remains static and does not change.
- ◉ The relational database schema defines the structure and constraints for flight and booking data, while the relational database instance stores real-time information such as current bookings, passenger details, and available flights.
- ○

The relational database instance defines the logical structure for flight bookings, while the relational database schema stores specific booking details like passengers' names and flight numbers.

Changes to the relational database instance (such as adding a new passenger to a flight) automatically require changes to the relational database schema.

3 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

In a retail database, the schema for the Products table is defined as follows:

- Products(ProductID, ProductName, Category, Price)

A query fetches the current list of products and their prices:

ProductID	ProductName	Category	Price
P001	Laptop	Electronics	50000
P002	Mobile Phone	Electronics	20000
P003	Headphones	Accessories	3000

Which of the following is true regarding the fetched data and its relation to the database schema?

The fetched data is a part of the database schema.

The fetched data indicates a change in the database schema.

The fetched data represents a snapshot of the database instance.

The fetched data shows the physical organization of the database.

The fetched data demonstrates schema normalization.

4 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

In a banking system, consider the following ER model:
- Entity: Customer (CustomerID, Name)
- Entity: Account (AccountID, Balance)
- Relationship: Owns (Customer ↔ Account)

Each customer can own multiple accounts, and each account must be owned by one customer. If a Joint Account is introduced, which can be owned by multiple customers, how should the ER model be modified?

- Add a JointAccount entity with attributes shared by all owners
- No changes needed
- Allow Owns to have multi-valued attributes
- Change Owns to a ternary relationship
- Add a weak entity JointOwnership with CustomerID and AccountID as foreign keys

5 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

Which of the following is NOT a direct benefit of the Three-Schema Architecture (ANSI/SPARC)?

- Changes in the physical storage of data do not affect the user views.
- Database administrators can modify the conceptual schema without impacting external user views.
- Different users can have personalised views of the data without altering the logical structure.
- Users need to be aware of the physical storage details, such as data compression or encryption.

6 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

You're part of a development team in a large e-commerce company that has a complex database system handling everything from inventory management to customer analytics. The company has different user roles interacting with the system based on their specific needs.

The marketing team needs to pull detailed reports on customer purchasing behaviour, such as frequently bought items, to target their campaigns. Which of the following would likely use complex SQL queries and deep data analysis techniques to get this information?

- Database Administrator (DBA)
- Data Scientist/Analyst
- Application Developer
- End User

7 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

In stock market trading systems, which data characteristic ensures transactions are processed in real-time?

- Veracity
- Velocity
- Variability
- Volume

8 Multiple Choice - Single Answer ✔ 2.0 View Answer

8 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

A hospital database uses the following ER model:

1. Entities: Patient, Doctor, Treatment
2. Relationships:
   a. Undergoes (Patient <-> Treatment)
   b. Prescribes (Doctor <-> Treatment)

If a Doctor entity has attributes: DoctorID (Primary Key), Name, and Specialization, and a Patient entity has attributes: PatientID (Primary Key), Name, and Age, which type of attribute is Age in the context of the ER model?

- (●) Simple Attribute
- ( ) Derived Attribute
- ( ) Composite Attribute
- ( ) Multi-Valued Attribute
- ( ) Key Attribute

9 Multiple Choice - Single Answer ✖ 0.0 Hide Answer

A university database maintains information about students, courses, and instructors. Each course is taught by an instructor and enrolled by multiple students. The relationship between students and courses is represented in a relational schema with the following tables:

- Student(StudentID, Name, Major)
- Course(CourseID, Title, InstructorID)
- Enrollment(StudentID, CourseID, Grade)

Which of the given relational model components is being implemented in the schema above?

- ( ) Primary Key and Foreign Key Relationships

9 Multiple Choice - Single Answer ✖ 0.0 Hide Answer

A university database maintains information about students, courses, and instructors. Each course is taught by an instructor and enrolled by multiple students. The relationship between students and courses is represented in a relational schema with the following tables:

- Student(StudentID, Name, Major)
- Course(CourseID, Title, InstructorID)
- Enrollment(StudentID, CourseID, Grade)

Which of the given relational model components is being implemented in the schema above?

- ○ Primary Key and Foreign Key Relationships
- ○ Entity Integrity and Domain Constraints
- ◉ Referential Integrity and Candidate Keys
- ○ Normalization and Functional Dependencies
- ○ Redundancy Elimination and Tuple Constraints

10 Multiple Choice - Single Answer ✔ 2.0 Hide Answer

You are tasked with ensuring the library database can efficiently manage book loans. Which of the following statements best describes how the tables and data are structured?

- ○ The "Books" table should store the loan date and return date, while the "Loans" table should only track book IDs and member IDs.
- ◉ The "Members" table holds contact information, and the "Loans" table links a member to a book using member_id and book_id to track which book was borrowed by which member.
- ○ The "Books" table requires a loan_id as a primary key to prevent multiple loans of the same book.
- ○ The "Loans" table should contain the title of the book and the name of the borrower, making it unnecessary to join the "Books" and "Members" tables.